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**STUDY AREA 43C
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

CONTRACT DAAA15-91-D-0008

**U.S. ARMY ENVIRONMENTAL CENTER
ABERDEEN PROVING GROUND, MARYLAND**

JANUARY 1995

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FORT DEVENS, MASSACHUSETTS**

Prepared for:

U.S. Army Environmental Center
Aberdeen Proving Ground, Maryland
Contract DAAA15-91-0008

Prepared by:

ABB Environmental Services, Inc.
Portland, Maine
Project No. 7053-12

JANUARY 1995

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FORT DEVENS, MASSACHUSETTS**

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EXECUTIVE SUMMARY

Investigations of Study Area 43C (Historic Gas Station Site) at Fort Devens, Massachusetts have resulted in the decision that no further hazardous waste studies or remediation are required at this site. Study Area 43C was identified in the Federal Facilities Agreement between the U.S. Environmental Protection Agency and the U.S. Department of Defense as a potential site of contamination.

Fort Devens was placed on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act as amended by the Superfund Amendments and Reauthorization Act on December 21, 1989. In addition, under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens was selected for cessation of operations and closure. In accordance with these acts, numerous studies, including a Master Environmental Plan, an Enhanced Preliminary Assessment, and a Site Investigation, have been conducted which address Study Area 43C.

Field investigation of Study Area 43C was initiated in 1992 in conjunction with the other 12 Groups 2, 7, and Historic Gas Stations Study Areas at Fort Devens. The Study Area 43C site investigation consisted of surficial geophysical surveys, which included a metal detector and ground penetrating radar survey.

The geophysical surveys indicated that one abandoned underground storage tank was present on the southern side of the existing pumphouse. This tank was removed by ATEC Environmental Consultants on August 27, 1992. ATEC performed field screening for volatile organic compounds and total petroleum hydrocarbons on eight soil samples collected from the walls of the excavation. One soil and one groundwater sample from the bottom of the excavation were collected for confirmatory laboratory analysis. The soil sample was analyzed for total petroleum hydrocarbons and the groundwater sample was analyzed for volatile organic compounds and total petroleum hydrocarbons. No volatile organic compounds were detected in groundwater and total petroleum hydrocarbon results were below the detection limit of the method. ABB Environmental Services, Inc. collected one composite sample from the bottom of the excavation for off-site laboratory analysis. Total petroleum hydrocarbons were detected at 78.2 parts per million. Based on ATEC Environmental Consultants' sampling results, the excavation was backfilled and no further site investigation was conducted.

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EXECUTIVE SUMMARY

On the basis of findings at Study Area 43C and the Preliminary Risk Evaluation, there is no evidence or reason to conclude that petroleum contamination due to the former underground storage tank has caused significant environmental contamination or poses a threat to human health. The decision has been made to remove Study Area 43C from further consideration in the Installation Restoration Program.

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1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43C - Historic Gas Station Site (SA 43C) at Fort Devens, Massachusetts. The report was prepared as part of the U.S. Department of Defense (DoD) Base Realignment and Closure (BRAC) program to assess the nature and extent of contamination associated with site operations at Fort Devens.

In conjunction with the Army's Installation Restoration Program (IRP), Fort Devens and the U.S. Army Environmental Center (USAEC; formerly the U.S. Army Toxic and Hazardous Materials Agency) initiated a Master Environmental Plan (MEP) in 1988. The MEP consists of assessments of the environmental status of SAs, specifies necessary investigations, and provides recommendations for response actions with the objective of identifying priorities for environmental restoration at Fort Devens. The Historic Gas Station Sites were identified in the MEP as potential areas of contamination. On December 21, 1989, Fort Devens was placed on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act.

An Enhanced Preliminary Assessment (PA) was also performed at Fort Devens to address areas not normally included in the CERCLA process, but requiring review prior to closure. A final version of the PA report was completed in April 1992. In 1992, DoD, through USAEC, also initiated a Site Investigation (SI) for SA 43A through S along with the other 12 SAs in SA Groups 2 and 7 at Fort Devens. The SI was conducted by ABB Environmental Services, Inc. (ABB-ES).

Under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens has been selected for cessation of operations and closure. An important aspect of BRAC actions is to determine environmental restoration requirements before property transfer can be considered. Studies at SA 43C were conducted to support this overall mission.

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2.0 BACKGROUND AND PHYSICAL SETTING

2.1 DESCRIPTION AND LAND USE

Fort Devens is located approximately 35 miles northwest of Boston, Massachusetts, within Middlesex and Worcester counties. The installation consists of approximately 9,280 acres and includes portions of the towns of Ayer, Harvard, Lancaster and Shirley. Cities in the vicinity include Fitchburg, Leominster and Lowell. Land surfaces range from about 200 feet above mean sea level (MSL) along the Nashua River in the northern portion of the installation to 450 feet above MSL in the southern portion of the installation.

Fort Devens was established in 1917 as Camp Devens, a temporary training camp for soldiers from the New England area. In 1931, the camp became a permanent installation and was redesignated as Fort Devens. Throughout its history, Fort Devens has served as a training and induction center for military personnel and a unit mobilization and demobilization site. All or portions of this function occurred during World Wars I and II, the Korean and Vietnam conflicts, and operations Desert Shield and Desert Storm. The primary mission of Fort Devens is to command, train, and provide logistical support for non-divisional troop units. The installation also supports that portion of the U.S. Army Intelligence School located at Fort Devens, for the Army Readiness Region, for Reserve Components, and for Army Reserve and National Guard in the New England area.

Fort Devens currently consists of three major land use areas: Main Post, South Post, and North Post (Figure 2-1).

The majority of the facilities on Fort Devens are located in the Main Post area, north of Massachusetts Highway 2. The Nashua River intersects the Main Post along its western edge. The Main Post provides all of the on-post housing, including over 1,700 family units and 9,800 bachelor units (barracks and unaccompanied officer's quarters). Other facilities on the Main Post include community support activities (such as a shoppette, cafeteria, post exchange, commissary, bowling alley, golf course, and hospital), administrative buildings, classrooms and training facilities, maintenance facilities, and ammunition storage facilities. The Historic Gas Station Sites, including SA 43C, are located on the Main Post.

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SECTION 2

The South Post is located south of Massachusetts Highway 2 and contains individual training areas designated for troop training, range activities, and a drop zone. The Nashua River bounds the South Post on the northeast side.

The North Post is directly north of the Main Post. The principal activities on the North Post are the Douglas E. Moore Army Airfield, and the installation Waste Water Treatment Plant.

2.2 REGIONAL GEOLOGY

Fort Devens is near the western boundary of the Seaboard Lowland Section of the New England-Maritime Physiographic province (Jahns, 1953). It is adjacent to the Worcester County Plateau of the Central Uplands province and part of the installation lies within the province (Koteff, 1966). The land surface is almost completely covered with unconsolidated glacial outwash deposits, resulting in few bedrock outcrops. The surficial deposits are underlain by a highly complex assemblage of intensely folded and faulted metasedimentary rocks with occasional igneous intrusions. The geomorphology of the region is dominated by glacial features such as outwash plains, kames, kame terraces, drumlins, and eskers.

2.3 REGIONAL HYDROGEOLOGY

Groundwater at Fort Devens occurs largely in the permeable glacial-deltaic outwash deposits of sand, gravel, and boulders. Well yields within these sediments are dependent upon the hydraulic characteristics of the aquifer and can range from 2 to over 300 gallons per minute (gpm). Small amounts of groundwater can be obtained from fractured bedrock with yields ranging from 2 to 10 gpm. Minor amounts of groundwater may be found in thin, permeable glacial lenses elsewhere on the installation. The primary hydrogeologic feature at Fort Devens is the Nashua River, which flows through the installation in a south to north direction, with an average discharge rate of 55 cubic feet per second. In addition to the Nashua River, the terrain is dissected by numerous brooks with attendant wetlands. There are also several kettle ponds and one kettle lake located within the installation.

2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43C, one of the 19 Historic Gas Station Sites, is included in the Group 2 SAs located on the Main Post. This SA is located off Queenstown Road (Figure 2-2). The structures of the historic gas station at SA 43C consisted of a pump island and a small gasoline pumphouse. Based on historic records, the gas station was a Type A station with one 5,000 gallon underground storage tank (UST) located between the gasoline pumphouse and the pump island. The station was used during World War II as a vehicle motor pool to support military operations. The motor pool operations were discontinued during the late 1940s or early 1950s. No records were available on the decommissioning of this motor pool and therefore, there was no evidence that the UST had been removed. The pumphouse (Building 3459) was still present at this SA prior to the SI field investigation. The pumphouse appeared to be constructed of corrugated steel and some piping was present in the building. The building was secured by a locked metal door. The area around the pumphouse is a gravel parking lot (see Figure 2-2).

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3.0 RELATED INVESTIGATIONS

3.1 MASTER ENVIRONMENTAL PLAN

SA 43, the Historic Gas Station Sites, was identified as a possible source for release of contaminants into the environment. The 19 gas stations were identified from a circa 1941 map (Barbour, 1941). The MEP recommended that the remaining USTs be located, and residual contamination in soil be removed (Biang, et al., 1992).

3.2 ENHANCED PRELIMINARY ASSESSMENT

The PA included a review of the study and recommendations presented in the MEP and considered other areas that might require evaluation due to the closure of Fort Devens. No additional findings or recommendations for SA 43C were provided in the PA.

3.3 SITE INVESTIGATION REPORT

The SI was initiated in June 1992 and included the following 13 Group 2 and 7 SAs originally identified in the MEP:

- SA 13 Landfill No. 9
- SA 43 Historic Gas Stations (19 Sites)
- SA 45 Lake George Street Vehicle Wash Area
- SA 49 Building 3602 Leaking Underground Storage Tank (LUST) Site
- SA 56 Building 2417 LUST Site
- SA 57 Building 3713 Fuel Oil Spill
- SA 58 Buildings 2648 and 2650 Fuel Oil Spills
- SA 12 Landfill No. 8
- SA 14 Landfill No. 10
- SA 27 Waste Explosive Detonation Range (Hotel)
- SA 28 Waste Explosive Detonation Range (Training Area 14)
- SA 41 Unauthorized Dumping Area (Site A)
- SA 42 Popping Furnace

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SECTION 3

The SI was conducted by ABB-ES under contract with the USAEC. The Final Site Investigation Report was issued in May 1993. The purpose of the SI was to verify the presence or absence of environmental contamination and to determine whether further investigation or remediation was warranted.

The SI field investigation program for SA 43C consisted of a surficial geophysical program which included a metal detector and ground penetrating radar (GPR) survey. The geophysical investigation conducted at SA 43C indicated that one abandoned UST was present on the southern side of the existing pumphouse (see Figure 2-2). The metal detector was used first to locate the UST and then the GPR survey identified the ends and the sides of the UST. The geophysical measurements collected in the field are presented in Appendix L of the SI Report (ABB-ES, 1993).

4.0 CONTAMINATION ASSESSMENT

The 5,000-gallon UST at SA 43C was removed by ATEC Environmental Consultants (ATEC) on August 27, 1992. The tank was observed to be severely corroded, without holes or perforations. Associated piping was also corroded (ATEC, 1992). Tank contents at the time of removal consisted of about 1,288 gallons of diesel fuel and sludge. The fuel was removed by Hitchcock Gas Engine Company. The scrap tank was disposed of at John C. Tombarello and Sons on September 1, 1992 (ATEC, 1992). Groundwater was observed in the UST excavation at a depth of approximately 10 feet below ground surface (bgs). Soil and groundwater samples were collected from the excavation to determine whether the contents of the UST had adversely impacted soil or groundwater quality at SA 43C. The results of the analyses are presented in the following paragraphs.

4.1 SOILS

At the time of the tank removal, ATEC performed field screening on eight soil samples (SS-1 through SS-8) collected from the excavation walls at depths of 5 feet to 6 feet bgs (see Figure 4-1). The headspace of the soil samples was screened with a photoionization detector (PID) for total volatile organic compounds (VOCs) and a Non-Dispersive Infrared (NDIR) Analyzer was used to screen for total petroleum hydrocarbons (TPHC). The PID results ranged from nondetect to 0.2 part per million (ppm), and TPHC levels were 20.5 to 287 ppm (ATEC, 1992) (Table 4-1). ATEC also collected one soil sample from the excavation for confirmatory laboratory analysis. The soil sample was analyzed for TPHC. This sample was analyzed by a non-USAEC certified laboratory and the data do not reside in the Installation Restoration Data Management Information System (IRDMIS). TPHC results were below the detection limit of the method (see Table 4-1). ABB-ES collected one composite soil sample from the bottom of the excavation. This sample was analyzed for TPHC using U.S. Environmental Protection Agency (USEPA) Method 418.1 at ABB-ES' Wakefield, Massachusetts laboratory. TPHC was detected at 78.2 ppm (see Table 4-1). Based on ATEC's sampling results, ATEC backfilled the excavation and no further site investigation was conducted (ATEC, 1992).

SECTION 4

4.2 GROUNDWATER

Groundwater was encountered at approximately 10 feet bgs in the former tank excavation. A groundwater sample was collected and analyzed at an off-site laboratory for VOCs and TPHC. This sample was analyzed at a non-USAEC certified laboratory, and the data do not reside in the IRDMIS. VOCs were not detected in the groundwater sample and TPHC results were below the detection limit of the method (see Table 4-1).

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

The UST at SA 43C was discovered by ABB-ES and removed by ATEC during the SI. Prior to backfilling, ATEC collected eight soil samples from the excavation walls, which were screened for TPHC by the NDIR method. TPHC levels ranged from 20.5 ppm to a maximum value of 287 ppm. The TPHC concentration in a confirmatory soil sample collected by ABB-ES for TPHC analysis by USEPA Method 418.1 was 78.2 ppm. A comparison of these results against the calculated risk-based commercial/industrial concentration value of 1,700 ppm for gasoline, and against the Massachusetts Contingency Plan's most conservative concentration of 500 ppm, indicates that there should be no significant risk to public health from soil contamination at SA 43C.

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6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

A preliminary ecological risk evaluation was not prepared for SA 43C because contaminants associated with a UST would be confined to subsurface soil, and would not impact any ecological receptors.

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7.0 CONCLUSIONS

Fuel-related soil contamination was not observed or detected in the soil or groundwater after the UST was removed from SA 43C. Based on these results it appears that the contents of the former UST did not adversely impact the soil or groundwater quality at SA 43C. Based on the results of the field investigation and sampling conducted by ABB-ES and by ATEC during the tank removal at SA 43C, no further action is recommended for this historic gas station site.

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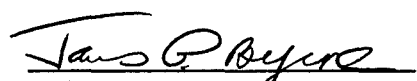
8.0 DECISION

On the basis of the findings at SA 43C, there is no evidence or reason to conclude that petroleum contamination from the former UST has caused significant environmental contamination or pose a threat to human health or the environment. The decision has been made to remove SA 43C from further consideration in the IRP process. In accordance with CERCLA 120 (h) (3), all remedial actions necessary have taken place, and the USEPA and MADEP signatures constitute concurrence in accordance with the same.


JAMES C. CHAMBERS
BRAC Environmental Coordinator

18 JAN 95
Date

U.S. ENVIRONMENTAL PROTECTION AGENCY

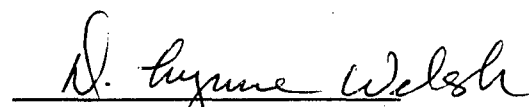

JAMES P. BYRNE
Fort Devens Remedial Project Manager

1/18/95
Date

☒ Concur

☐ Non-concur (Please provide reasons for non-concurrence in writing)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION


D. LYNNE WELSH
Section Chief, Federal Facilities - CERO

1/18/95
Date

☒ Concur

☐ Non-concur (Please provide reasons for non-concurrence in writing)

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
ATEC	ATEC Environmental Consultants
bgs	below ground surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DoD	U.S. Department of Defense
gpm	gallons per minute
GPR	ground penetrating radar
IRDMIS	Installation Restoration Data Management Information System
IRP	Installation Restoration Program
LUST	leaking underground storage tank
MEP	Master Environmental Plan
MSL	mean sea level
NDIR	Non-Dispersive Infrared
PA	Enhanced Preliminary Assessment
PID	photoionization detector
ppm	part per million
SA	Study Area
SI	site investigation
TPHC	total petroleum hydrocarbon compounds
USAEC	U.S. Army Environmental Center
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

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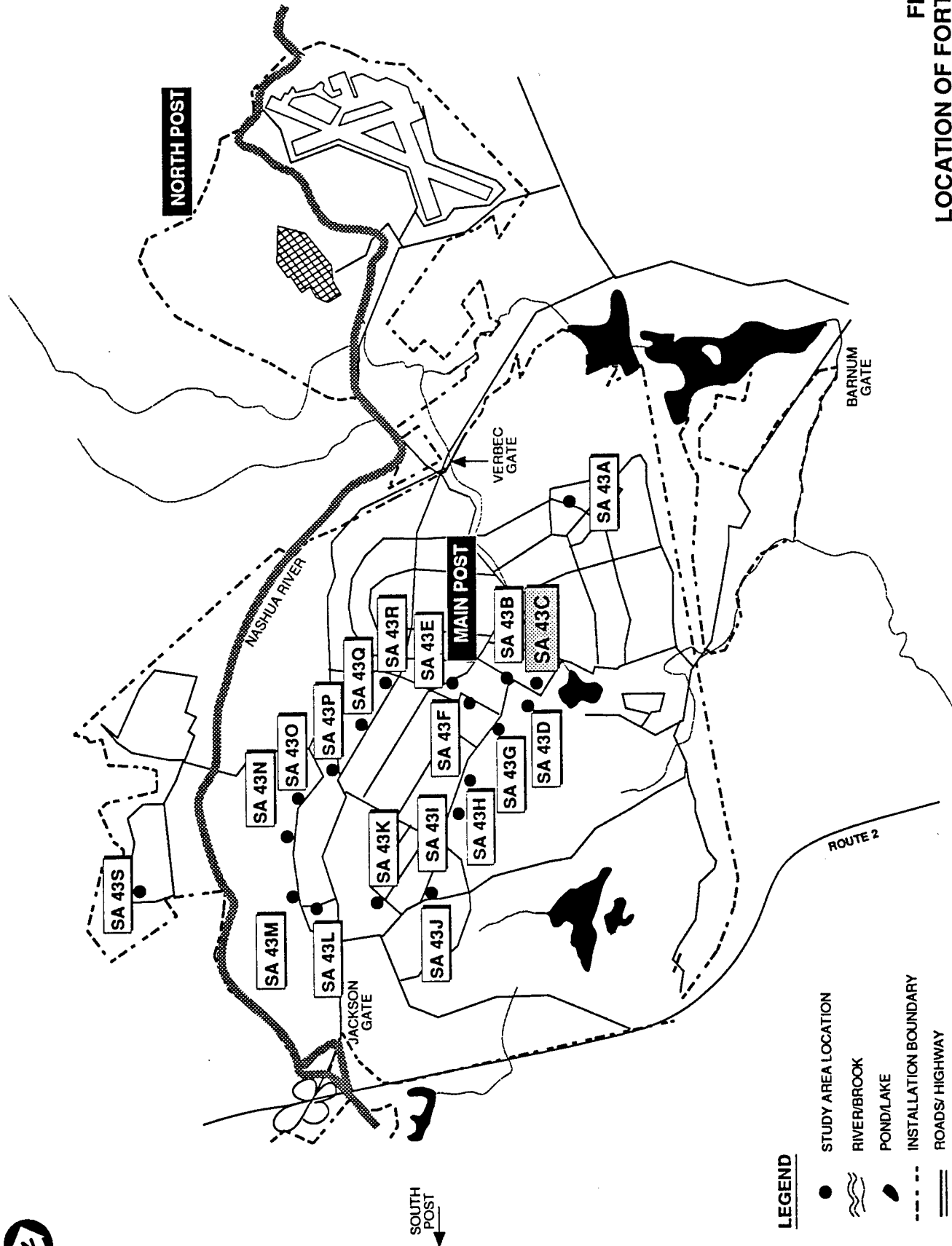
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LEGEND

- STUDY AREA LOCATION
- ~ RIVER/BROOK
- POND/LAKE
- - - INSTALLATION BOUNDARY
- == ROADS/HIGHWAY

SCALE IN FEET



FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43C DECISION DOCUMENT
FORT DEVENS, MA

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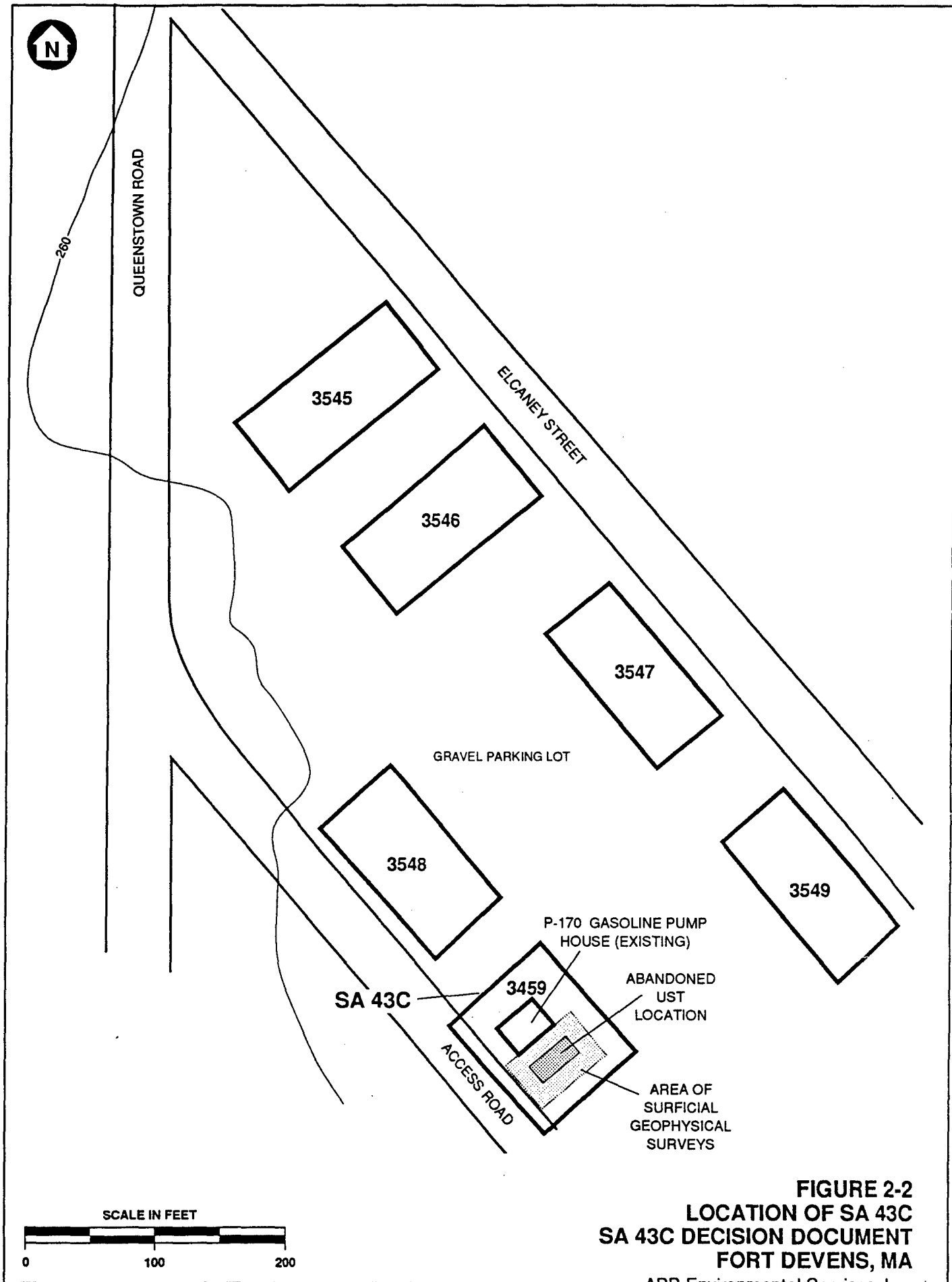


FIGURE 2-2
LOCATION OF SA 43C
SA 43C DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

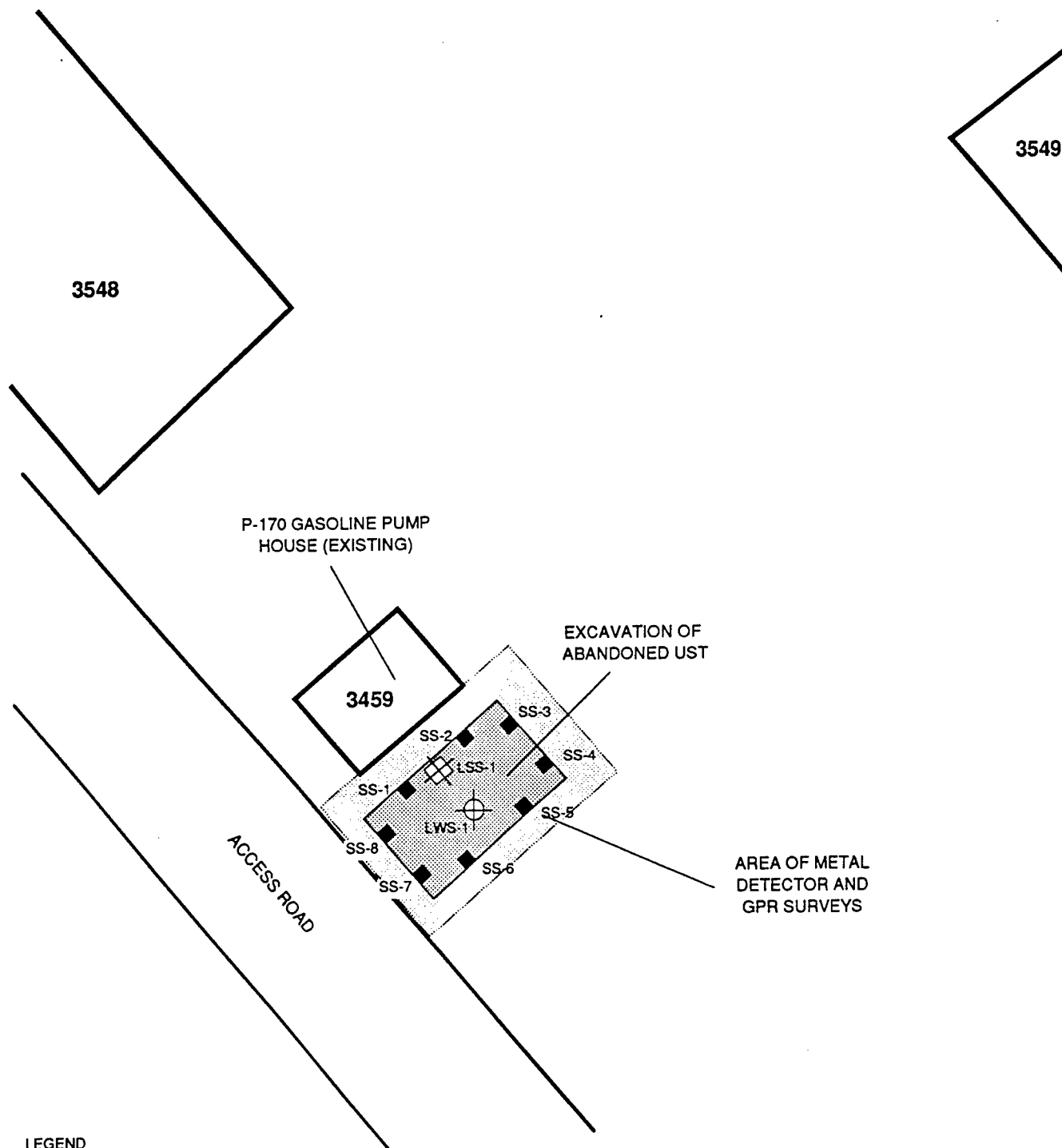


FIGURE 4-1
LOCATION OF HISTORIC GAS STATION
SA 43C DECISION DOCUMENT
FORT DEVENS, MA

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TABLE 4-1
ATEC/ABB-ES FIELD SCREENING RESULTS
SA 43C - HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

SAMPLE NO.	FIELD SCREENING		LABORATORY	
	PID (ppm)	NDIR (ppm)	VOC (ppm)	TPHC (ppm)
SS-1	0.2	232	N/A	N/A
SS-2	ND	20.5	N/A	N/A
SS-3	ND	29.3	N/A	N/A
SS-4	ND	99.2	N/A	N/A
SS-5	ND	287	N/A	N/A
SS-6	ND	96.7	N/A	N/A
SS-7	0.2	72.5	N/A	N/A
SS-8	ND	42.1	N/A	N/A
LSS-1	N/A	N/A	N/A	0.0
LWS-1	N/A	N/A	ND	0.0
XCE-92-01X	N/A	N/A	N/A	78.2

NOTES:

SS = ATEC field screening soil sample

LSS = ATEC laboratory soil sample

LWS = ATEC laboratory water sample

XCE-92-01X = ABB-ES laboratory composite soil sample

ND = Non detect

N/A = Not analyzed

PID = Photoionization Detector

NDIR = Non-Dispersive Infrared

VOC = Volatile Organic Compound

TPHC = Total Petroleum Hydrocarbon Compounds

PPM = Part Per Million